9. Remedial Action Objectives

The previous sections of this ROD have summarized the nature of the Joint Site, including the presence of NAPL, the distribution and types of contamination, the potential groundwater-related health risks posed by the Joint Site, and the basis for taking action at the Joint Site. This section briefly establishes the remedial action objectives given this information. Sections 10, 11, and 12 discuss and evaluate the basis for a TI waiver and the extent of the containment zone, discuss the factors necessary to understand the remedial alternatives, describe the alternatives, compare the alternatives, and justify the selected alternative. Section 13 presents the remedial action selected in provisional form.

The remedial action objectives for the action selected in this ROD are consistent with both CERCLA and the NCP. As set out in CERCLA, each selected remedial action must:

> "[A]ttain a degree of cleanup of hazardous substances, pollutants and contaminants released into the environment and of control of further release at a minimum which assures protection of human health and the environment..." [42 U.S.C. §9621(d)(1)]; and
>
> Comply with or attain the level of "any standard, requirement, criteria, or limitation under any Federal environmental law" or "any promulgated standard, requirement, criteria or limitation under a State environmental or facility siting law that is more stringent than any Federal standard, requirement, criteria or limitation" that is found to be applicable or relevant and appropriate [42 U.S.C. §9621(d)(2)(A)(i)&(ii)].

9.1 In-Situ Groundwater Standards

The particular in-situ concentration for a contaminant which this ROD requires be attained in groundwater at the conclusion of the remedial action shall be referred to by this ROD as the ***in-situ groundwater standard***, or ***ISGS.***

This ROD selects the following:

- The ISGS is the lower (i.e. more stringent) of the federal and State of California Maximum Contaminant Level, or MCL, the drinking water standards promulgated under the Safe Drinking Water Act;

- *Solely* for contaminants for which neither a federal nor a State MCL is promulgated, the ISGS is the EPA Region IX tap water Preliminary Risk Goal (PRG).

The ISGS levels that shall be applied in this remedial action are shown in Table 9-1. This table shows the chemicals detected at the Joint Site, the federal and State MCL where available, the PRG, and the resulting ISGS level[1]. To evaluate the prevalence of detection of most of the chemicals, other than the driving chemicals discussed in Section 7, the reader should consult the Montrose Remedial Investigation Report or the Del Amo Groundwater Remedial Investigation Report.

The selection of the ISGS for each contaminant is determined by applicable or relevant and appropriate requirements, and by the CERCLA requirement that remedies be protective of human health and the environment. This is discussed below.

All groundwater at the Joint Site has been designated by the State of California as having a potential potable beneficial use that would include drinking water [*Water Quality Control Plan, Los Angeles Basin*, California Regional Water Quality Control Board, Los Angeles Region, June 13, 1994; "the Basin Plan"]. When groundwater poses an actual or potential health risk and is a potential drinking water source or could affect a drinking water source, the NCP directs EPA to restore groundwater to federal and State drinking water standards, in a reasonable time frame. The NCP states, at 40 C.F.R. 300.430(a)(1)(iii)(F):

> EPA expects to return usable groundwaters to their beneficial uses whenever possible, within a time frame that is reasonable given the particular circumstances at the site. When restoration of groundwater to beneficial uses is not practicable, EPA expects to prevent further migration of the plume, prevent exposure to the contaminated groundwater, and evaluate further risk reduction."

Drinking water standards are considered relevant and appropriate as cleanup standards in-situ in groundwater and are selected by this ROD as Applicable or Relevant and Appropriate Requirements (ARAR; see Appendix A of this ROD) for the remedial action selected by this ROD as per 42 U.S.C. §9621(d)(2)(A)(ii), 40 C.F.R. 300.430(e)(2)(i)(B) and 55 Fed. Reg. 8750-8754 (March 8, 1990). These ARARs are described in Appendix A. The NCP requires the in-situ attainment of the federal or State drinking water standard, whichever is lower. This standard is commonly known as the Maximum Contaminant Level, or MCL. The lower of these two standards for the three most-prevalent Joint Site groundwater contaminants is:

[1]Three sporadically-detected compounds did not have MCL or PRG values. In these cases, EPA has selected reasonable toxicological surrogate compounds (which have similar chemical properties and would be expected to have similar toxicological properties to the compound in question) and EPA has based the ISGS upon the PRG for the surrogate compound. These chemicals were not consistently detected, do not present in a discernable distribution, and provide an insignificant portion of mass and volume of groundwater contamination, as well as the risk posed by the Joint Site groundwater. These compounds are footnoted on Table 9-1.

- 70 parts per billion (ppb) for chlorobenzene;
- 1 ppb for benzene; and
- 5 ppb for TCE.

The value of the PRG is the concentration of the contaminant in groundwater that would pose the lower of a one-in-one-million cancer risk (10^{-6} risk) or a hazard index of unity, assuming standard risk assessment assumptions for residential water use. Solely for chemicals for which no federal or State MCL is promulgated, EPA is selecting the PRG as a remedial action standard to ensure protectiveness of human health and the environment. EPA does not consider PRGs as promulgated cleanup standards, and PRGs are not ARARs. However, it is reasonable to use the PRGs as standards to ensure protectiveness in cases where promulgated standards are not available, because such use is consistent with the NCP provision that 10^{-6} risk and hazard index of 1 should be the point of departure for determining remediation goals [40 C.F.R. 300.430(e)(2)(I)(A)(2)] and the fact that MCLs, when they are promulgated, are usually based on these same levels of risk.

There is an area of groundwater for which attainment of the ISGS is not technically practicable, and the requirement to attain ISGS levels for this groundwater is therefore waived. This is discussed in Section 10 of this ROD.

It is important to make a distinction between *in-situ* cleanup standards, as opposed to *discharge* standards. The former, *in-situ*, means "in place," and refers to the concentration of contaminants which must be attained in the water *in the ground* before the remedial action can be considered complete. The later refers to the concentration of contaminants which must be attained in *treated water* before the water can be discharged under the remedial action. These two are not always the same. ARARs which pertain to EPA's discharge of treated water as a result of this remedial action are identified in Appendix A and further discussed in Section 11 of this ROD.

9.2 Remedial Action Objectives

Remedial objectives apply in addition to the NCP and CERCLA requirement that remedial actions be protective of human health and the environment and attain ARARs in a reasonable time frame. The following remedial action objectives apply to this action.

1. Where technically practicable, reduce the concentrations of contaminants in Joint Site groundwater to ISGS levels;

2. In areas of groundwater where attainment of ISGS levels is not technically practicable, *contain* contaminants within their current lateral extent and depth;

3. Isolate NAPL by surrounding it with a zone of groundwater from which dissolved phase contaminants cannot escape;

4. Prevent lateral and vertical migration of dissolved phase contaminants at concentrations greater than ISGS levels to areas where currently they are not present or are below ISGS levels; and

5. Protect current and future users of groundwater from exposure to Joint Site groundwater contaminants at concentrations above ISGS levels.

In evaluating actions to meet these objectives, EPA has also sought to:

1. Reasonably limit the potential for adverse migration of dissolved phase contaminants and the potential for inducing accelerated movement of NAPL. This refers to the undesired movement of contamination in a manner that would violate or impede the objectives of the remedial action in the long term. This is discussed more fully in Section 11.1 of this ROD.

2. Account for and limit long-term uncertainties over the course of the remedial action. This is further discussed in Section 12 of this ROD.

Table 9-1
In Situ Groundwater Standards (ISGS)
Record of Decision for Dual Site Groundwater Operable Unit
Montrose Chemical and Del Amo Superfund Sites

Compound	Federal MCL (µg/L)	State MCL (µg/L)	EPA 1998 Tap Water PRGs (µg/L) (Listed only when Federal or State MCLs do not exist)	ISGS [1] (µg/L)
Acetone	-	-	610	610
Acrolein	-	-	0.042	0.042
Acrylonitrile	-	-	3.7	3.7
Aldrin	-	-	0.004	0.004
Alpha-BHC	-	-	0.011	0.011
Benzene	5	1	-	1
Beta-BHC	-	-	0.037	0.037
Beta-Endosulfan	-	-	220	220
Bromoform	100	100	-	100
Bromomethane	-	-	8.7	8.7
Di-n-Butyl phthalate	-	-	3700	3700
sec-Butylbenzene	-	-	61	61
Carbon Disulfide	-	-	1,000	1,000
Carbon Tetrachloride	5	0.5	-	0.5
Chlorobenzene	100	70	-	70
Chloroethane	-	-	8600	8600
Chloroform	100	100	-	100
Chloromethane	-	-	1.5	1.5
2-Chlorophenol	-	-	38	38
Cyclohexane	-	-	-[2]	350 [2]
DDD(total)	-	-	0.28	0.28
DDE(total)	-	-	0.20	0.20
DDT(total)	-	-	0.20	0.20
1,2-Dichlorobenzene	600	600	-	600
1,3-Dichlorobenzene	-	-	17	17
1,4-Dicholorobenzene	75	5	-	5
Dichlorobromomethane	100	100	-	100
1,1-Dichloroethane	-	5	-	5
1,2-Dichloroethane	5	0.5	-	0.5
1,1-Dichloroethene	7	6	-	6
cis-1,2-Dichloroethene	70	6	-	6
trans-1,2-Dichloroethene	100	10	-	10
1,2-Dichloropropane	5	5	-	5
Diethylphthalate	-	-	29,000	29,000
Endrin	2	2	-	2
Ethylbenzene	700	700	-	700
Freon 11	-	150	-	150
Freon 12	-	-	390	390
Gamma-BHC	0.2	0.2	-	0.2
Heptachlor	0.4	0.01	-	0.01

Compound	Federal MCL (µg/L)	State MCL (µg/L)	EPA 1998 Tap Water PRGs (µg/L) (Listed only when Federal or State MCLs do not exist)	ISGS [1] (µg/L)
Heptachlor epoxide	0.2	0.01	-	0.01
2-Hexanone	-	-	1604	1604
Isopropylbenzene	-	-	61	61
Methyl Ethyl Ketone	-	-	1900	1900
4-Methyl-2-Pentanone	-	-	160	160
Methylene Chloride	5	5	-	5
2-Methylnaphthalene	-	-	-3	6.2 3
Naphthalene	-	-	6.2	6.2
Pentachlorophenol	1	1	-	1
Phenol	-	-	22,000	22,000
n-Propylbenzene	-	-	61	61
Styrene	100	100	-	100
1,1,2,2-Tetrachloroethane	-	1	-	1
Tetrachloroethene	5	5	-	5
Toluene	1,000	150	-	150
1,2,4-Trichlorobenzene	70	70	-	70
1,1,1-Trichloroethane	200	200	-	200
1,1,2-Trichloroethane	5	5	-	5
Trichloroethene	5	5	-	5
1,2,4-Trimethylbenzene	-	-	12	12
Vinyl Acetate	-	-	410	410
Vinyl Chloride	2	0.5	-	0.5
Xylenes (total)	10,000	1,750	-	1,750

Notes:

1- The In Situ Groundwater Standard for each chemical detected is the more stringent of the federal and state MCL where these exist. Solely for chemicals with no state or federal MCL promulgated, the ISGS is the EPA May 7, 1998 tap water PRG.

2- There is no MCL or PRG available for cyclohexane. The ISGS value is based on the PRG for n-Hexane, which is used as a surrogate compound for cyclohexane.

3- There is no MCL or PRG available for 2-Methylnaphthalene. The ISGS value is based on the PRG for Naphthalene, which is used as a surrogate compound for 2-Methylnapthalene.

4- There is no MCL or PRG available for 2-Hexanone. The ISGS value is based on the PRG for Methyl Isobutyl Ketone, which is used as a surrogate component for 2-Hexanone.

2-4: Toxicological surrogate compounds would be expected to have similar toxicological properties to the compounds in question. The three contaminants noted were not consistently detected, do not present in a discernable distribution, and provide an insignificant portion of mass and volume of groundwater contamination, as well as the risk posed by the Joint Site groundwater.